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ABSTRACT

The first of three units of the 4-H Outdoorsman Program is designed to teach basic campcraft skills and to promote environmental awareness for 4-H members in British Columbia, Alberta, Saskatchewan, and Manitoba. The manual contains information and instruction on; special responsibilities in the outdoors (including conservation and clean up), first aid, knives and their use, knotcraft, campfires, campouts, hiking on field trips, orienteering without a map or compass, studying the environment, records and recordkeeping. The requirements for the outdoor kit for display on Achievement Day are listed, as well as fun time action projects to be done at leisure. A project evaluation form and metric conversion tables are included. (JMM)

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ALBERTA AGRICULTURE

This Manual is produced for 4-H members and leaders enrolled in the 4-H program and administered by:

The British Columbia Department of Agriculture
4-H Clubs' Branch

Alberta Agriculture
4-H Branch

The University of Saskatchewan
Extension Division

The Manitoba Department of Agriculture
4-H and Youth Section, Community and Family Programs Branch

4-H MOTTO

Learn to do by doing.

4-H PLEDGE

I pledge
My HEAD to clearer thinking,
My HEART to greater loyalty,
My HANDS to larger service,
My HEALTH to better living,
For my club, my community, and my country.

4-H GRACE

(Tune of Auld Lang Syne)

We thank thee, Lord, for blessings great
On this, our own fair land.
Teach us to serve thee joyfully,
With head, heart, health, and hand.

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INTRODUCTION

There are limitless campcraft skills to learn. The various campcraft projects outlined in this Unit merely provide you with a place to begin.

Only so much can be learned from a book. The rest must be learned by trial and error, success and failure. This means you must organize trips into the great outdoors and put into practice what you read.

ACHIEVEMENT DAY REQUIREMENTS:

1. Complete at least three exercises under "Activities and Projects in the Outdoors" in Unit I manual.

2. Learn three knots and mount samples in your outdoor kit.

3. Make a simple compass and describe how it works; complete the pacing exercises.

4. Write a diary of either a hike, field trip, or camp-out.

5. Display records and samples in a separate notebook on an environmental study of your choosing - choose one of: insects, pond, leaves, or trees.

6. Give at least one demonstration throughout the year or on Achievement Day and include a record of it in your project book.

7. Complete a record of project meetings throughout the year.

8. Summarize the special activities you participated in throughout the year.

9. Include pictures of some of your outdoor activities.

For these projects you may want to develop a notebook or kit separate from the Unit I manual to display your exhibits. Use a book that will hold heavy pages and that you can add to as you complete various projects. A large, three-ring binder would be suitable.

Two symbols will be used in this project:

will indicate Achievement Day projects that you must complete.

will indicate Action Time: fun projects for you to do when you have time.

So much to learn - so much to do! Welcome to Unit I and the great outdoors.

SPECIAL RESPONSIBILITIES IN THE OUTDOORS

Personal safety, respect for the interests of others, and conservation of the areas used are your responsibilities. Practicing these will mean a better outdoor experience for yourself as well as for others.

CARE

Proper safety precautions are essential!

TAKE SAFETY SERIOUSLY

Also be prepared for emergencies especially when you are in remote areas or near deep water. Remember that weather conditions can change suddenly, so take sufficient clothing. It is better to have too much than too little.

CONDUCT

Maintain good relations with those who use the land for other purposes such as: farmers, foresters, and other owners and tenants. Responsible conduct will not prevent future visits by your group or other field parties.

RESPECT OWNERSHIP

Make sure that you have obtained permission from the owner before going on to private land. Ask him about any hazards and activities you should avoid. Respect his wishes even if you cannot always see the reasons for them. Either see or write him after your visit and thank him. You may require a written permit to visit some areas. Take care that you observe any special requests that apply in such cases.

THINK OF OTHER USES OF THE COUNTRYSIDE

Areas of land or water are often put to more than one use, and these need not conflict with field work. Anglers and other sportsmen are as much entitled to enjoy the countryside as you are so do not spoil their pleasure.

GIVE NO ONE CAUSE TO REGRET YOUR VISIT

Be careful that your activities do not give field studies a bad name. Show that your intention is serious and reflect this in the way you behave. Fasten gates after you leave and avoid damaging fences, hedges, and stone walls.

Remember the dangers of fire and litter. Livestock can easily be injured by broken glass and discarded metal objects; they may even eat polyethylene bags with fatal results.

CONSERVATION

Some clubs feel drawn to wild and remote places for their fieldwork and camping. Attractive though these places are, their area is shrinking fast and what is left would soon be damaged or destroyed by too much educational and recreational use. There are almost always "Man Made" habitats, which are less sensitive to trampling and collecting and available nearer home. On such ground, a considerable portion of the time devoted to outdoor studies may be profitably spent.

BEWARE OF THE COLLECTOR

Most field work can be done without collecting specimens. Unnecessary collecting is wasteful and can rapidly lessen the interest of an area. Use sketching or photography instead. If collecting is essential to your work, make sure that you take only enough for your needs; use a proper container, and if in a party, appoint specific collectors for the necessary specimens. Where possible, return living material to the exact spot from which it was taken; never put it in an inappropriate environment. Permission is required to collect in conservation areas, and provincial and national parks.

SAFEGUARD RARE SPECIES

A rare species may become still more rare if you collect it, even by mistake; too often rarities have been collected for identification because they were unfamiliar. Persuade others to share your respect for the uncommon. As a general rule, do not collect any living thing which is the only one in the area.

ACTION TIME - Living Things Reproducing

Observe as many examples of living things reproducing as you can. Compose two lists, one for animals, another for plants. Common examples for animals are: eggs of insects beneath boards, young spiders near a web, insect cocoons beneath the eaves, and bird nests. Plant examples may include the presence of seeds or seedlings.

AVOID DISTURBING PLANTS AND ANIMALS

Trees and some other growing things, such as moss cushions and lichens on rocks, take many years to develop, yet they can be thoughtlessly defaced or destroyed in a moment. If you turn over logs or stones, especially in water, remember to turn them back again and replace them carefully, or the animals which live underneath may die.

Take special care when birds are nesting. A nest is more likely to be deserted or robbed by predators if it has been exposed. Eggs may go cold or young birds die if you stay near the nest too long. Other people may also be studying the plants and animals; be thoughtful of their interests when carrying out your work.

ACTION TIME - Making Bird Nests

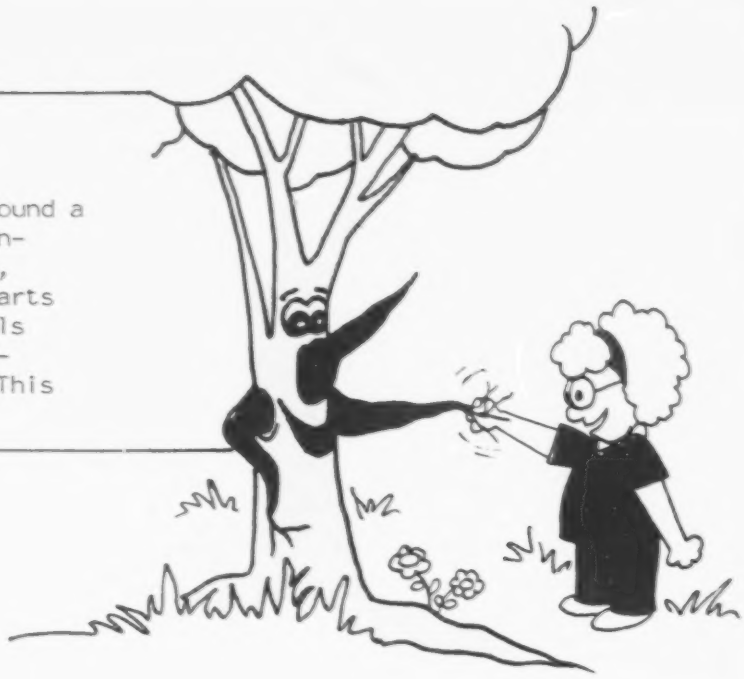
Try building a bird's nest using materials available to you from nature. What problems did you have in making it? Test the completed nest by seeing if you can pick it up from the ground.

LEAVE THE AREA AS YOU FOUND IT

Trampling causes damage to farm crops and young trees and can also seriously alter the area that you are most interested in studying. Remember that grass is a crop and costs money to grow. Try to keep your movements to a minimum especially along streams and pond margins and on other wet ground. Thoughtless hammering on rocks may not only ruin their scientific interest but also undermine or disfigure other people's property. Never collect geological specimens from walls or buildings. Sharp stones left lying around are a hazard to livestock, vehicles, and machinery.

ACTION TIME -
Life On a Tree

Look carefully around a tree and list all the animals, insects and plants that are in, on, beneath, and around it. Make charts showing how the plants and animals depend on each other and live together in this true community. This is called an ecosystem.



CLEAN CAMPING

A camp isn't healthy unless it is clean. Unfortunately, this is where most people are careless. However, great importance should be given to this topic so you can enjoy camping more and so the next group to camp at the same spot will have a place which shows minimal use.

PRACTICAL SANITATION ON THE TRAIL AND IN CAMP

1. Drinking Water and Food

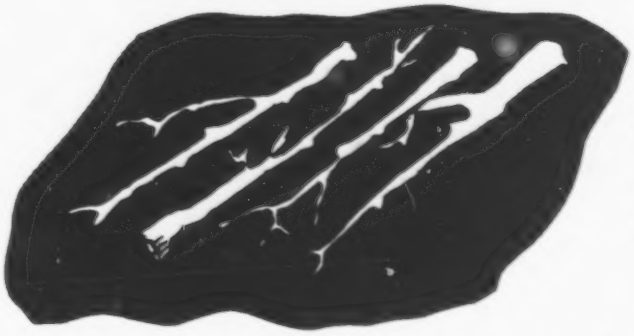
The first area where cleanliness is absolutely necessary is in the drinking water set up. It isn't just a matter of making certain that the water is pure, but also of using clean containers for carrying it, storing it, and for keeping it covered.

Any water which you suspect is impure should be boiled for at least five minutes and cooled before drinking. Another method of purifying water is to add Halazone or Globaline tablets to it (two tablets per litre), then allow it to stand for 30 minutes. Open food should be protected with netting held away from it to prevent insects from landing on it. Open containers or cans of food should be kept covered with wax paper or tin foil.

2. Body Cleanliness

Next in importance comes your personal cleanliness. For this reason one of the first things you have to do when you arrive in camp is to make a latrine.

If you plan to camp for any length of time in one spot, you must get rid of waste in one particular area where it will be of no hazard to water supplies. A latrine should be located at least 65 metres downwind from the tent area and as far as possible from any usable water. The latrine pit should be dug in a low area so all liquids will sink into the ground immediately below the pit. The pit should be at least 60 centimetres deep and the dirt should be saved for filling after each use. If you plan to camp long in one location, chlorinated lime should be sprinkled in the pit before covering with dirt in order to reduce odour. Poles tied between trees can serve as a seat and a roll of tissue on a branch can be protected with a large, inverted tin. A bucket of water nearby for washing hands is a useful sanitary addition. Portable toilets and tents to shelter them are relatively expensive but very convenient if you are car-camping.



If you have a shovel, dig a latrine. The hole is 90 cm long, about 60 cm deep and 25 cm across, covered with spruce branches.
Dig at least 65 metres from camp, downwind. Keep the dirt to fill it in when you leave.

Swimming will not keep your body clean; you need to take regular soap baths as well. Do this at a spot by the river or lake below your swimming area. Use the same place for washing dirty clothes.

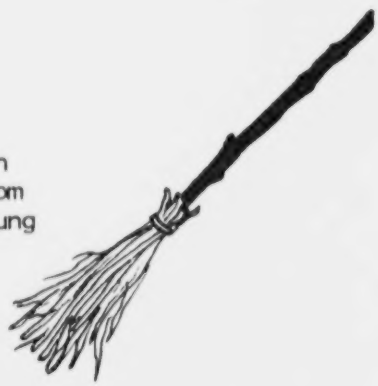
Keeping hands and face clean helps keep infection from small cuts and scrapes to a minimum. Clean socks and feet will almost eliminate sore feet and blisters on a back-packing journey. Washing clothing, especially underwear, is important to avoid irritation. If clothing cannot be washed, it should be turned inside out and aired in the sun for a few hours.

To hang clothes or pots out of the way, use one of these branches.

A dead tree might be used to hold cups, towels, and wet socks.

Keep the interior of your tent clean and your clothes will stay cleaner. This can be done by using a light-weight tarp or sheet of plastic over the tent floor so that it can be removed and shaken clean. Also a piece of canvas or old carpet could be used as a mat outside the tent door. If it is wet outside, remove footwear before entering the tent. If the tent does not have a floor, a ground sheet can be used to help keep things dry and sanitary.

To keep the camp clean and neat, a small broom could be made from young shrubs.



3. Washing Dishes and Disposal of Cooking Water

Wash dishes and pots immediately after a meal not just to keep flies away, but also because left-over food particles provide a perfect breeding ground for certain dangerous bacteria. Put a pot of water over the fire the minute you finish cooking; in this way you'll have scalding hot water when you need it for clean-up. Use soap or a detergent. You can bring enough liquid detergent for the whole camping period in a small container.

Before washing, wipe dishes clean with grass, then throw the grass into the fire to burn.

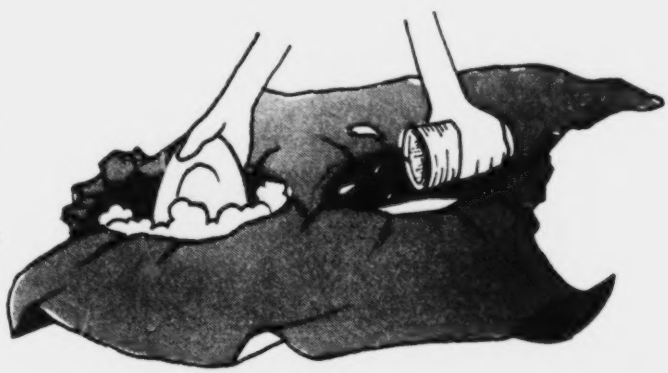
To keep from being scalded, use a mop made by tying a wad of cloth to a notched stick.

Clean the dishes in hot water containing a detergent or soap.

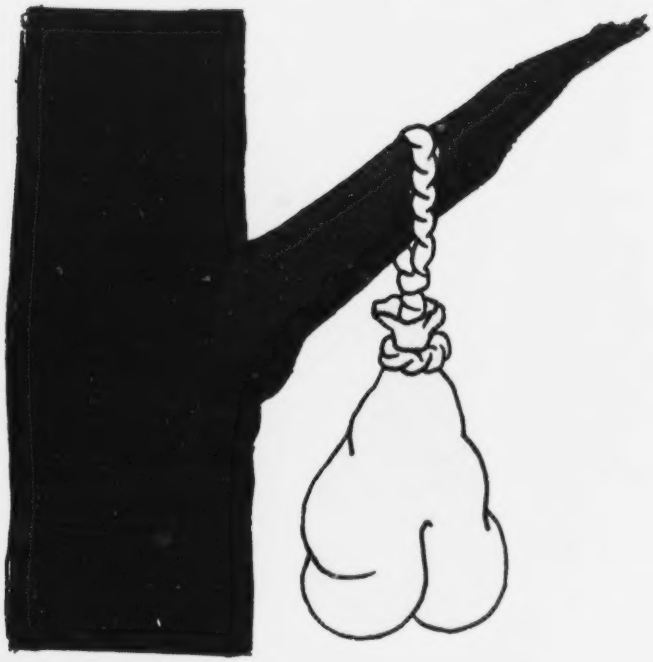
Rinse dishware in hot water. If the pot of water is too small for immersing dishes, pour water over them.

The dish water should not be dumped near the tent because it will collect flies. You should dig a small hole, pour the water in it, and cover it with dirt immediately.

In lightweight camp-outs a plastic sheet takes the place of heavy pots. Dig two holes and press the plastic sheet into them. Put the liquid detergent in one and the rinse water in the other.



Let the dishes "air dry". Then store them in a flyproof container.



4. Disposal of Garbage

Anything burnable such as paper plates, corn husks, and grocery wrappers can be burned. Chocolate wrappers, especially, should be burned as soon as possible because they will attract insects and possibly bears. In a much used camping area without garbage cans, you should not bury foil or plastics. Always bring them out of the campsite to dispose of in the proper receptacles.

A grease trap should be made to avoid attracting insects. This consists of a tight screen of dead grass over a small hole into which water mixed with grease in the bottom of a pan can be poured. The water will run through and the grease will be trapped. After an hour in the sun, burn the grass and then make a fresh screen.

Scouring pads should be wrapped or kept in a container because food particles trapped in them will attract insects.

REMEMBER!

When you finally have to leave camp and are ready to tear everything down, restore the site to its natural state. Fireplaces should be torn apart and covered up, holes should be filled in and all lumber should be stacked low so it will rot. You can stand long poles up against a tree for future use. Take rocks and boulders back to their stream bed. Leave everything as clean and neat as it was when you came there.

FIRST AID

In many instances, a little knowledge of first-aid might be worse than no knowledge. However, the correct attitude and presence of mind is essential.

Probably the most important quality you possess is common sense. This is especially true where first aid is concerned. Any judgement you may have to make should involve as little medical technique and as much common sense as possible.

Quick! This too is a key word in first-aid. Quickness implies speed combined with a high degree of efficiency and effectiveness not just speed alone. Proceed as fast as you can without losing control over what you are doing.

Be observant. In circumstances varying from extreme shock to home sickness only your eyes can "tell" you what is wrong. Learn to recognize all signs and changes from usual behaviour.

Resourcefulness is being able to make use of the materials on hand.

If you must move the person, be gentle. Depending on the injury or illness sudden movement may cause extreme pain and damage.

The patient's state of mind is extremely important. If you are tactful and don't alarm him, his chance of becoming hysterical or falling into deep shock is reduced.

FIRST AID KIT

Anyone who goes into the outdoors should equip himself with an adequate first-aid kit and the knowledge of how to use it. Many excellent ready-made kits are available at drug stores and other commercial outlets. However, these first-aid kits are generally designed for special situations such as travelling by automobile or boat. Many of these kits do not include provisions for those accidents most likely to occur in wilderness country.

You may find it interesting to assemble your own individual first-aid kit. Here are some suggestions:

TAKE:	FOR:
25 aspirin tablets, 5-grain	Treating headache and relieving shock
1 small bottle of 2% tincture of iodine	Disinfecting small wounds and treating drinking water
1 pair sharp-pointed forceps	Removing slivers and thorns
1 tube multi-purpose first-aid ointment	Treating burns and insect bites
1 pair of small scissors, best available	Cutting bandages
6 safety pins	Fastening bandages
1 bottle of salt tablets	Treating salt depletion
1 jar of petroleum jelly	Treating chafing and abrasions
1 jar of insect repellent	
6 gauze compresses, 9 cm square in sterile packages	Covering minor wounds and blisters
6 assorted gauze roller bandages of various widths in sterile packages	Application over wounds and holding compresses in place
1 100 cm triangular bandage in a sterile package	Covering dressing, slings, tourniquettes, or padding
2 rolls of 5 cm adhesive tape	Taping compresses in place, emergency repairs to tents and clothing
1 package of adhesive compresses of various sizes	Direct application to minor wounds

Pack these articles into a sturdy container. Use a solid plastic container with a tight-fitting lid or a tin box which can be rendered waterproof with plastic tape. Fill in any empty spaces in your kit with band-aids - first-aid kits never have enough.

Your first-aid kit can be augmented with salt and baking soda from your cooking supplies. Salt can be used to make an emergency heating pad for treating ear-ache or muscular aches. Take 0.5 kg of salt and heat it in a frying pan until very hot. Place the heated salt in a cloth bag and wrap it in a terry cloth towel. Your salt heating pad will hold its heat for several hours.

Baking soda is truly a camper's friend. It can be used for treating sun burn, insect bites, and poison ivy itching as well as being an excellent water softener and tooth powder.

Treat burns and bites with a wet soda paste held in place with a gauze compress and adhesive tape. For larger areas such as a sun burn, wet a large handkerchief, sprinkle it with dry baking soda, and drape it over the burned area.

If possible enroll in some form of first-aid training, such as that provided by the St. John Ambulance Society. Such training may prove invaluable in an emergency. If you are not in a position to take first-aid training, obtain an up-to-date first-aid manual and study it.

Try to avoid accidents to yourself and others by obeying the rules of common sense and by taking extra precautions in camp and on the trail. Be particularly careful with edged tools such as axes and knives. When not in actual use, these tools should be sheathed and put in a safe place.

Foreign matter in the eyes, ear, nose, and throat will usually come out naturally--by sneezing, coughing, or tearing. If not, don't rub or poke around trying to pick the offending matter out--see a doctor.

Know and recognize poison ivy, oak, and sumac. The ivy grows mainly in the east--the other two in the western parts of the country.

The irritant in the plant is an oily substance secreted by the leaves, berries, wood, and bark. You can become infected by coming in contact with any of these, or by touching a dog or clothing which has brushed against the plant. You might even be affected by sitting in the smoke of a fire in which some of the plant is being burned. If a rash does develop, bathe the affected area in a strong soapy lather as soon as possible. Apply a dressing of baking soda or calamine lotion to ease the itch. Don't scratch or use greasy ointments that will spread the infection.

Bees leave their stinger in the victim. Use tweezers to yank out the hair-size root of the trouble. Bites from hornets, wasps, spiders, and the like leave a small painful swelling but no stinger. Cleanse the area and try baking soda to relieve the pain.

Blood suckers and ticks must be removed carefully usually by heat or salt, which makes them release their grip. Cleanse the area with soap and water and use soda to ease the pain. Apply a bandage.

Chiggers and mites bury themselves in the skin and have to be removed with a sterilized needle. Cleanse the wound and put on a bandage.

If there is any sign of reaction to a sting--if the swelling seems abnormally large or the patient becomes ill, seek medical help.

Mosquitoes and black flies are more of a nuisance than anything else--although some people do react to their bite. Fighting clouds of these with an insecticide is rather fruitless--there are just too many. The best idea is to find and use a good repellent.

When you are bitten, try a baking soda paste or first-aid cream to relieve the itch. Then leave the bites alone--they'll eventually disappear. Don't scratch them, they may become infected.

FIRST-AID TIPS

Look for the following:

1. Difficulty in breathing
2. Heavy bleeding
3. Poisoning
4. Fractures

NOTE: Look for abnormal signs to decide if medical help is necessary.

To reach help:

1. Send one of your party to the nearest ranger station, fire tower, or phone.

2. A distress signal can be sent out. (Eg. a smudge fire, or any signal in threes - 3 whistles.)

If the patient is not breathing, start artificial respiration IMMEDIATELY!

KNIVES

A good knife with a sturdy blade and a keen edge is the pride of many an outdoorsman. A good knife supplied with a strong sheath and treated with respect can last a lifetime.

Before you buy, decide what purpose you want your knife to serve. Most sportsmen choose a multi-purpose knife - one to make kindling, to slice bread or to field dress an animal. There is no one knife that will do all of these things perfectly, but some utility knives come close.

A blade 10-15 cm long will suit most of your needs in the outdoors. There are specific types of blades for special needs: skinning knives have a fat or wide blade, bird knives are short and narrow with a thicker type of blade, and filleting knives are extremely narrow and sharp pointed.

BASIC TYPES OF KNIVES

1. Pocket - usually more than one blade, includes gadgets like can openers
   - small and easily carried; blades fold into the handle
   - not as rugged as other types
   - easier to lose

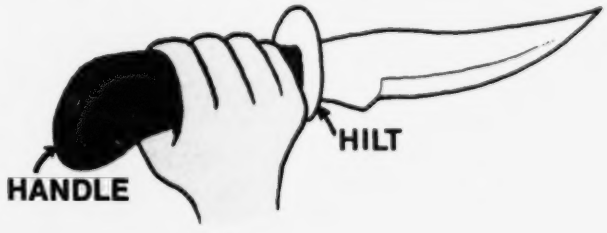
2. Fixed Blade - handle tang (the core) should be forged as one piece
   - most rugged and durable
   - keep it sheathed

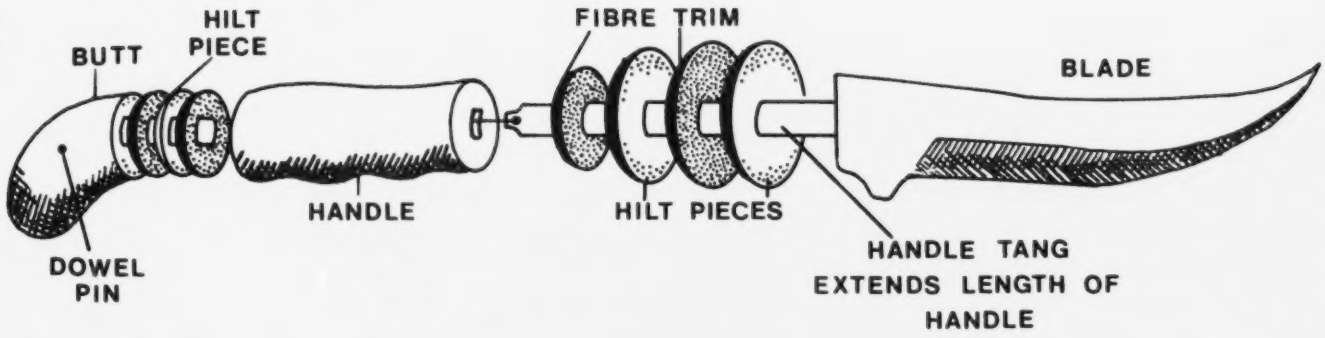
3. Folding Lock - single blade that folds into the handle, opens into a locked position
   - rugged but not as durable as fixed blade type
   - can be carried anywhere
   - blade should fit neatly into the slot without any play or twist

HANDLES

Handle shape is a matter of choice so long as it feels good in the hand. The handle must hold firm when wet or bloody. Composition handles do not keep an odour so are a better choice than wood. Leather handles are a good choice for hunting but poor for fishing. Staghorn is also a good choice. Avoid plastic or metal handles as they tend to be slippery when wet and cold in winter.

Is the handle long enough? If you grip the handle in a stabbing manner, the handle should extend just slightly beyond your fist. The hilt should be big enough to keep your hand from slipping onto the blade when cutting.





TYPE OF BLADE

1. Carbon Steel
   - takes a razor edge quickly
   - requires constant care
   - must be kept clean at all times or it will rust

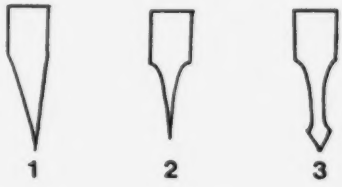
2. Stainless Steel
   - takes longer to sharpen, is hardened
   - maintenance free
   - virtually rust proof

BLADE EDGE TYPES

1. Flat Ground:
   - gradually tapers from heel of the blade to tip
   - harder to cut with than other types due to blade thickness
   - good for field dressing

2. Full Hollow Ground:
   - best for filleting fish
   - not practical for much else

3. Semi-hollow Ground:
   - best all purpose type

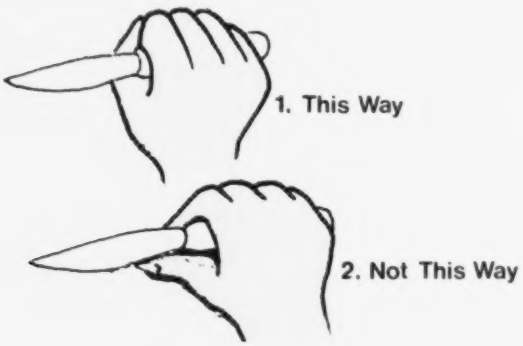


SHARPENING

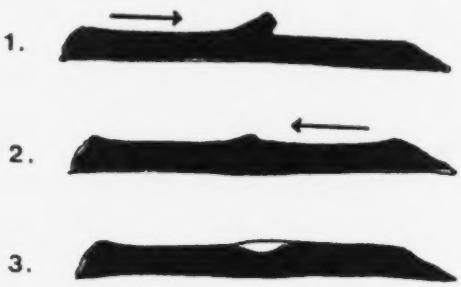
Always keep a knife sharp as it is easier to just touch up a blade than start from scratch to sharpen it. Use a clean stone and oil. Before sharpening, clean the knife blade.

1. Oil the stone generously and spread it over the entire surface.
2. Use a firm steady pressure, starting from the heel of the blade and ending each stroke by lifting the handle to sharpen the point.
3. Alternate the sides of the blade as you sharpen it about 11-15 times.
4. Draw the knife at a 15° angle as if you were taking a thin slice off the top of the bladestone.
5. Wipe it clean and apply some gun oil or light oil to prevent rust.
6. Put the stone in a container until the next time.

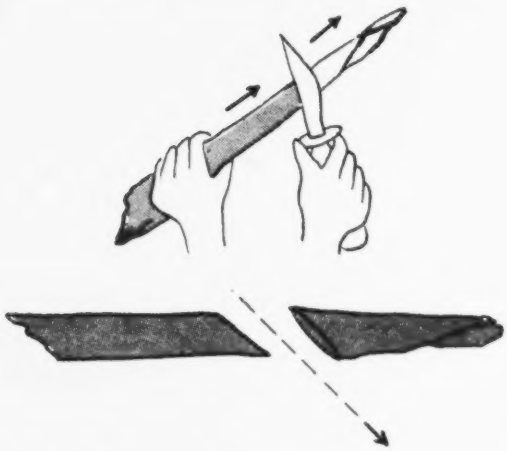
USE YOUR KNIFE PROPERLY



How to hold your knife correctly for whittling.



HOW TO CUT TWIGS



Diagonal Cut for Twigs

HOW TO CUT BRANCHES

V-Cut for Large Branches

Action Time - Knife Sheath

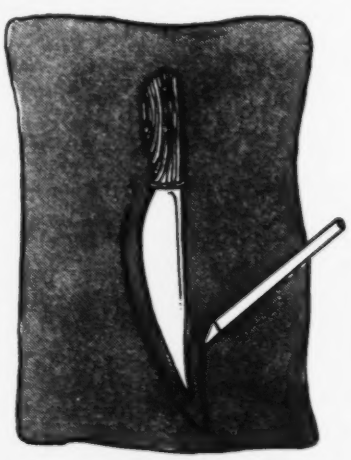
A good knife deserves the protection of a sturdy sheath. Perhaps your knife sheath is worn out or too light to be serviceable. Here is a simple yet sturdy sheath which you can easily make.

Materials:

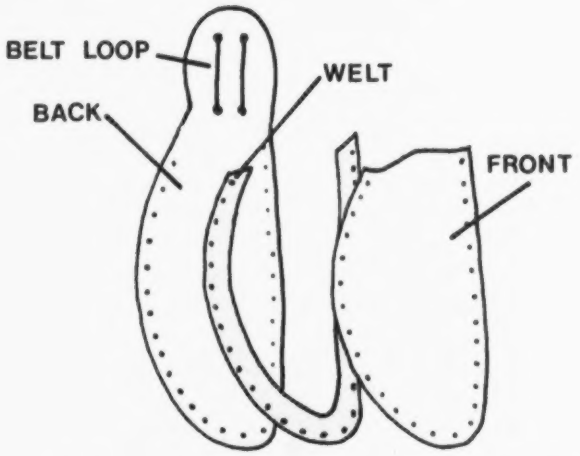
medium weight saddle leather
a sharp knife
an awl
two harness needles
heavy shoemaker's linen thread

Instructions:

1. Make a paper pattern for the sheath allowing lots of room for the blade plus 0.8 cm around the outer edge for rivets and stitching.



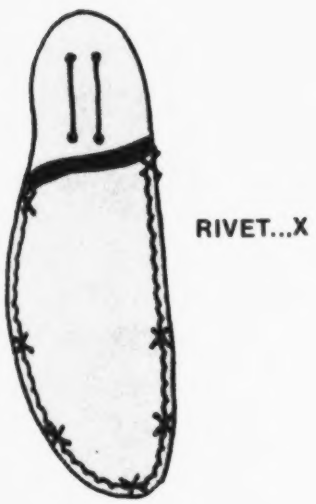
STEP 1



STEP 2

2. Cut the back, front, and welt from the leather. The welt should be 0.8 cm on the sides and 1.4 cm where the knife point rides. Mark the stitch and punch holes 0.3 cm apart with the awl.

STEP 3



STEP 4

3. Twist two strands of the thread and place a needle at each end. Pass thread through the top holes, then pass needles through the next hole from opposite directions and pull tight.

4. Buff the edges and have the sheath riveted at a shoemaker's shop.

KNOTCRAFT

Do you know a clove hitch from a half hitch? Do you know the proper way to lash shear poles for your tent? If not, your outdoor education is incomplete. A mastery of several fundamental knots and lashings will help you to solve many camp problems and may even save a life in an emergency.

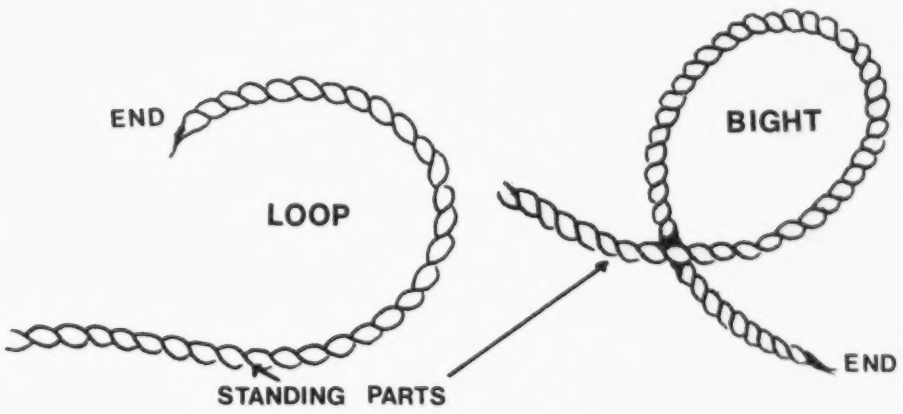
A survey of the catalogue of knots would reveal that there are about 4,000 different knots in existence. To be useful to an outdoorsman, a knot must meet three requirements.

1. It must be easy to tie.
2. It must be easy to untie.
3. It must hold securely until it is untied or the rope breaks.

PARTS

A rope has four parts:

1. The end - the short part of the rope used in tying the knot.
2. The standing part - the long part of the rope which remains inactive in knot-tying.
3. The loop - formed by placing the end of the rope alongside the standing part of the rope.
4. The bight - formed from a loop by placing the end over or under the standing part of the rope.

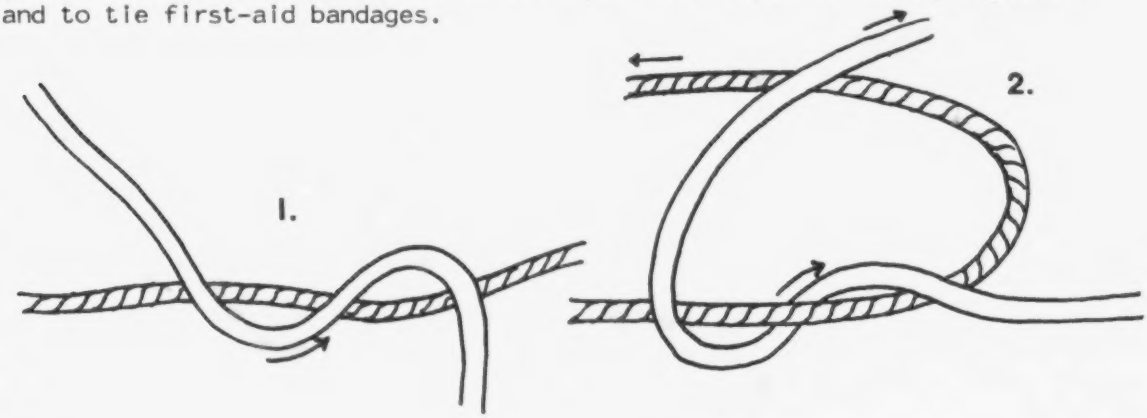


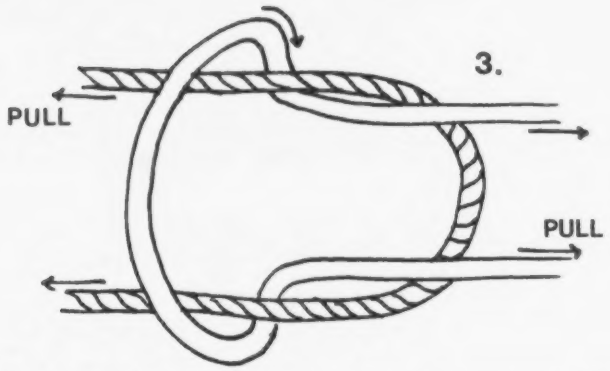
BASIC KNOT TYPES

There are five basic knots which are very useful in camp and on the trail. Learn these knots and you will be able to tie almost anything that needs to be tied.

THE REEF KNOT

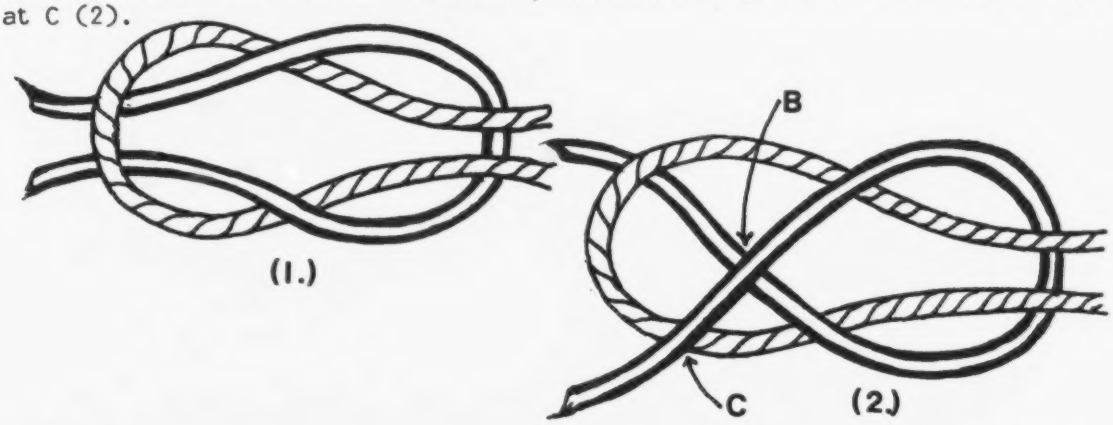
The reef or square knot is a simple knot that ties and unties easily yet will not slip. It is used to tie equal size ropes or string together and to tie first-aid bandages.



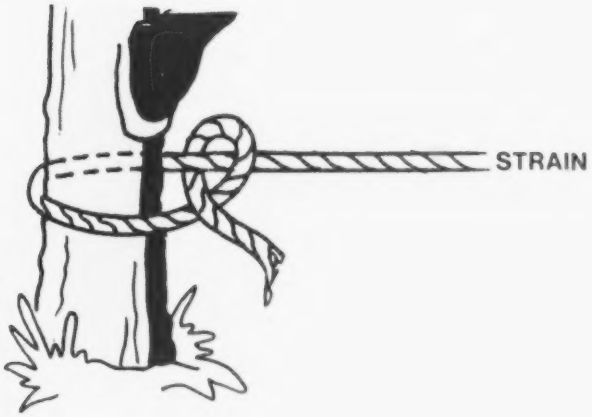


THE SHEET BEND

The sheet bend is used to join two ropes of unequal thickness. Make a reef knot (1) but take the end of the smaller rope and cross it under the other piece of the smaller rope at B, and then up and over the thicker rope at C (2).

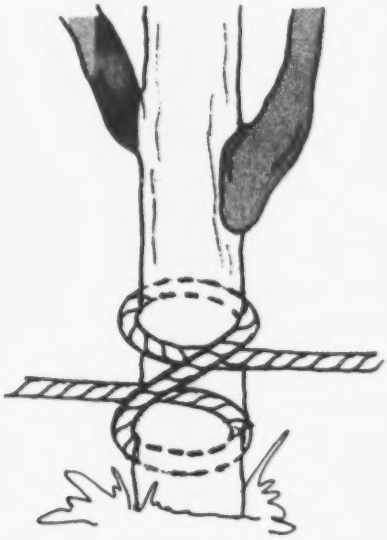


Knots for tying ropes to an object:



THE HALF HITCH

The half-hitch is a quick method of securing a boat line or tent line to a post, mooring ring, or tree. Half hitches are commonly used in pairs.

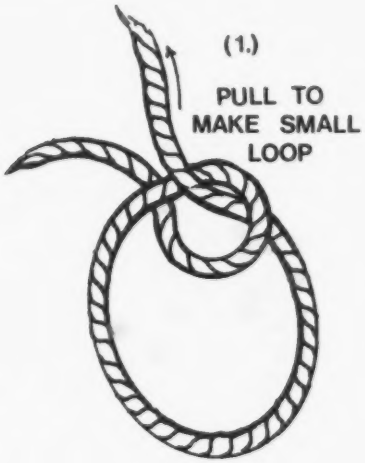


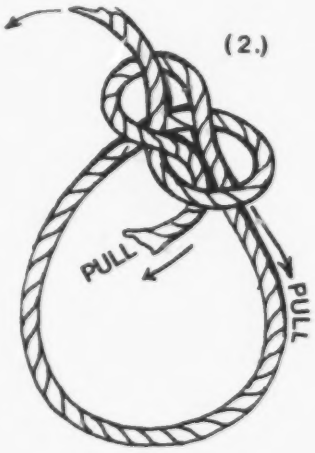
THE CLOVE HITCH

The clove hitch is used in situations where a half hitch could be used. All lashings begin with a clove hitch.

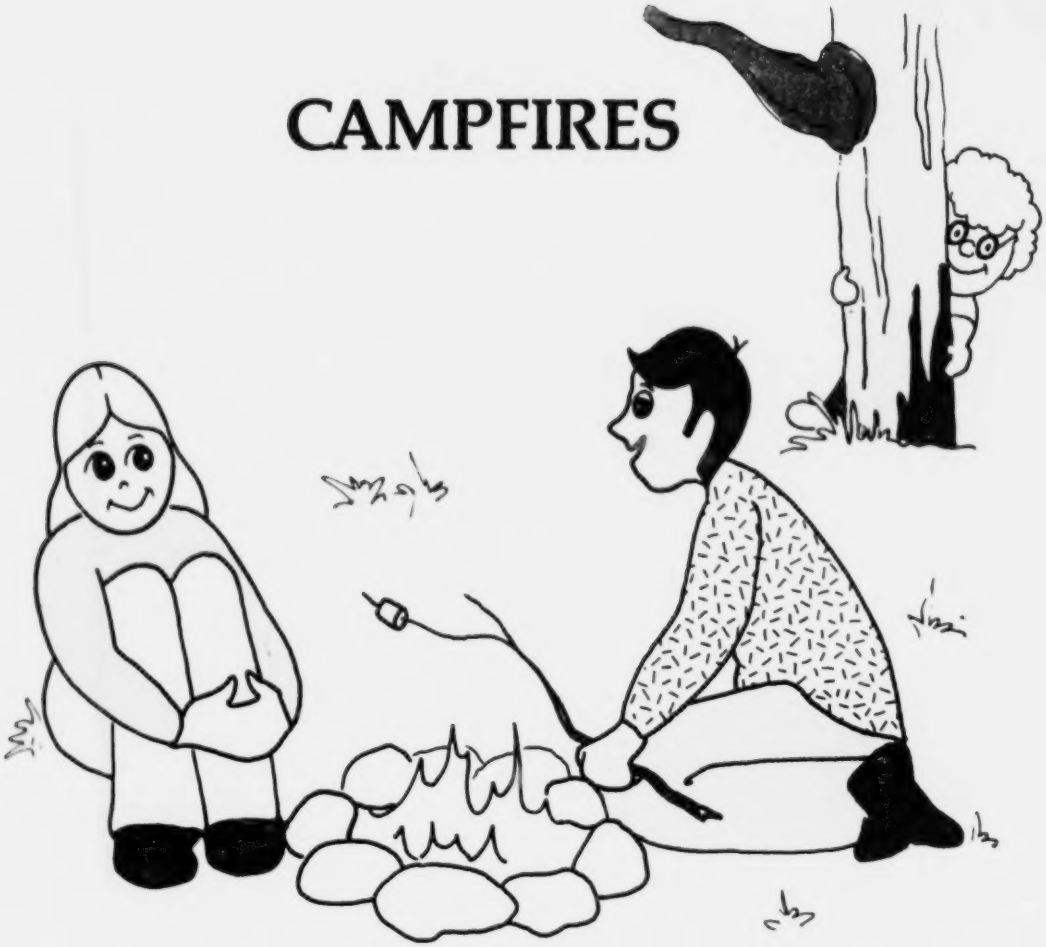
THE BOWLINE

The bowline was used to pull hundreds of seamen from the ocean during rescue work in World War II. The bowline forms a fixed loop which will not slip under tension.





CAMPFIRES



BUILDING A CAMPFIRE

During an overnight camp-out or on a long field-trip your leader may ask you to build a campfire. You should know how a woodsman builds a safe, effective campfire.

A rule which should always be followed is, "NEVER GO INTO THE FOREST WITHOUT A SUPPLY OF MATCHES OR A KNIFE AND FLINT." A fire is very important. Not only does it keep you warm, cook your food, and keep up your morale, but it can also be an effective signal to any searching parties looking for you. The smoke can be seen by day and the flame by night, and search parties will be able to smell the campfire smoke over a wide area.

PRECAUTIONS

1. Select the safest possible site for your fire. Never build a campfire near brush piles or against trees or logs; be absolutely certain the fire does not have a chance to spread and cause a forest fire. Also be sure the smoke does not travel toward the entrance of your shelter.

2. Scrape away all leaves, humus, and inflammable material from a spot 1.5 m in diameter and dig down to bare mineral earth.

3. All materials used in building should be incombustible or difficult to burn, such as rocks, green saplings, mud, and dirt.

4. A good supply of water should be kept on hand to quench a fire or to decrease its size. Never pour the water onto a fire directly, sprinkle or spread the flow out with one of your hands over all the embers and ashes. Then stir the ashes and sprinkle again.

5. The secret of starting a fire with one match is to have dry tinder and plenty of ventilation. Even the driest and most inflammable tinder needs air to burn. Your tinder should be finely cut or shredded to obtain the most ventilation possible. The purpose of the tinder is to burn quickly and ignite the kindling. Your kindling can be split wood or 5 and 8 cm thick twigs. Once the kindling is burning well, you can add slightly larger pieces of wood.

   The best fuel will be standing dead trees and dry limbs. If you can find any dried pitch, it will ignite very easily. Split the wood very finely into shavings, then small sticks, and larger ones.

   If it is difficult to find tinder, scrape your clothing with a knife or sharp rock. Fine lint hairs will come off. When you have scraped up enough, light it and put it on the shavings.

INSIDE DECAYED STUMPS

PITCH FOUND IN TREE WOUNDS

SHAVING STICK

LINT SHAVINGS FROM CLOTHING

DRY BARK AND LEAVES

6. The shape of your fire doesn't matter too much as long as it is well-ventilated. For cooking, a long narrow fire is best as you can rake the coals to one end while a good blaze burns at the other end. If you enclose the fire with rocks, avoid damp, porous rocks as they may explode when heated. Dry willow roots and stalks provide excellent, long lasting coals. Birch, pine, and spruce are the next best fuels, in that order.

Prepare a fire site on grassy ground by removing sods. Store sods so that you can replace them afterwards.

7. Fire should also be used to get rid of some of your garbage. Items that don't burn should be carried out of the camping area and put in the proper receptacles.

8. When you break camp, tear down your fire completely leaving everything the way it was before you set foot on the forest floor. Any moss or humus you scraped away should be placed back over the ashes. Any rocks or stones should be put back where they came from, and all wood should be put in a pile low to the ground.

REMEMBER!!

Never leave a campfire unattended! When you must leave the fire, even for a short time, put it out. Douse it with water and spread the embers. Turn larger logs over. Thoroughly soak every piece of fuel and quench every spark. Scatter the ashes and cover the fireplace with dirt. Be certain that the fire is not smoldering beneath the surface.

CAMPOUTS

PLANNING

The successful hike, field trip, or campout is the one that is well organized. Some points to keep in mind if you are involved in the planning are:

1. The planning must be carried out several days in advance of the event.

2. Have a theme and a purpose for the hike or field trip.

3. Gather all the equipment you will need for the trip and check it off on a list before leaving. Some of the articles your group will find useful are pencils, notebooks, binoculars, and perhaps collecting equipment and cameras.

4. One or more members of your group should be designated to carry adequate first-aid equipment.

5. If you are going to require meals for the study group during the trip, they should be simple and easy to prepare and transport.

6. All parents should be informed of the approximate location of the field study and approximately what time you and the group expect to return home.

CAMPING EQUIPMENT

For campouts, you will want to be well prepared. Personal equipment and sleeping gear are major considerations.

PERSONAL EQUIPMENT

1 sleeping bag (good for freezing temperatures)
1 warm jacket
1 warm sweater
2 pairs of shorts
1 pair of swimming trunks
1 pair of canvas runners
2 shirts or sweat shirts
3 pairs of socks
1 pair of slippers (moccasins)
1 canteen (also water purification tablets)
Eating utensils, towel, and toothbrush
1 large waterproof bag (to store clothes and sleeping bag)
1 hat (sun protection)
Alberta fishing license (if going fishing)
1 fishing rod and reel, leaders, and lines. Hooks and fly-tying equipment.

Optional

Binoculars	Gloves to prevent blistered hands
Flashlight	Camera and extra film
Foam pad	Burn cream (wind and sun)
Sheath knife	

SLEEPING GEAR

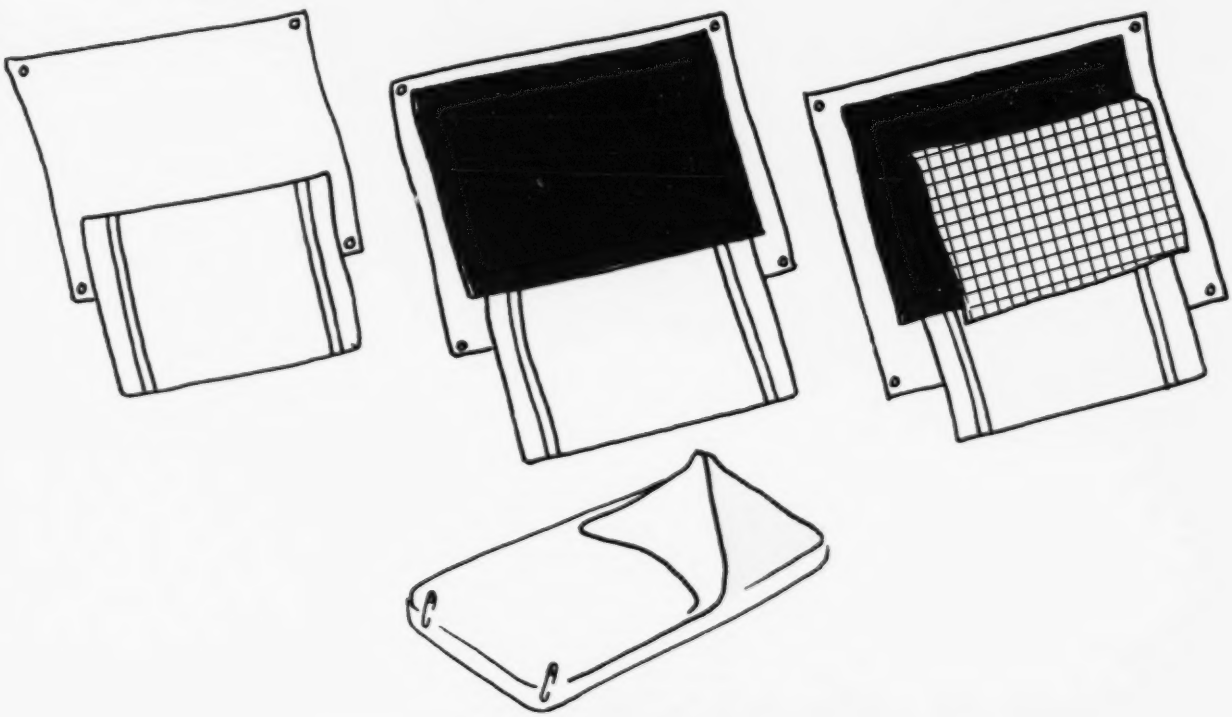
A wise outdoorsman appreciates the value of a good night's sleep and equips himself with the most comfortable sleeping gear he can afford.

1. Sleeping Bag

For many campers, a light, inexpensive sleeping bag is the answer. The filling is a sleeping bag's most important feature and determines its price. Pure goose down is found in the best bags. Down gives the most warmth for the least weight. Dacron Fiberfill is less expensive and will be suitable for most camping. Dacron Fiberfill retains its springiness and is moisture and mildew-proof.

Perhaps you do not wish to purchase a sleeping bag. Blankets are the next choice. Your blankets should be of dark, one hundred per cent virgin wool. The loose weave and long nap of virgin wool creates air pockets which act as insulators.

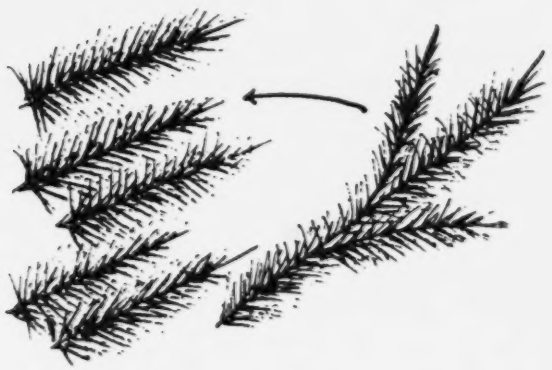
Make your own sleeping bag by pinning a "flip-flop" bed with blanket pins and adding a 1.5 cm sponge rubber pad for insulation and comfort (See diagram below showing the different stages to follow to make your "flip-flop" bed).



2. Boughbeds

A good boughbed can be as comfortable as a mattress, and is much healthier than sleeping on the bare ground. Moisture in the ground gets drawn into your sleeping bags and can cause a cold.

Only the outer 20-25 cm of a spruce branch is used because it is springy and soft and insulates well. This is pushed into a thin layer of spruce branches, covering the floor of the shelter. The butt is pushed down to the ground, so your body comes in contact with the soft, springy end of the twig. Filling the lean-to floor is not unlike covering the lean-to. Thickness is up to the individual. Once the floor is covered, try it out and fill the thin spots. It is a good idea to put a large log in front of your lean-to, to prevent the bed from spreading out all over the place.



To break these twigs off, bend them upwards. They show more resistance to a downward bend because they support their own weight plus the weight of snow in the winter. Small spruce usually have the best tips, but don't break them all off. They need some to keep growing. Grab the twig between your thumb and first two fingers, then push your thumb between your fingers, breaking the twig.

A comfortable lean-to and boughbed can really look inviting in the middle of an otherwise unfriendly forest.

SHELTER

Never travel at night. Not only is it extremely dangerous, but you might walk past an important landmark or road without seeing it.

Before dark, it is important that you construct some type of shelter. Keeping warm and dry is necessary as well as important in keeping up your spirits.

Choose a place near drinking water and near evergreens and wood so you don't waste time carrying these things. Level, high ground for good drainage is also a must. Take advantage of large trees or overhanging ledges to expose your lean-to to the least amount of weather.

ACTION TIME - Poncho

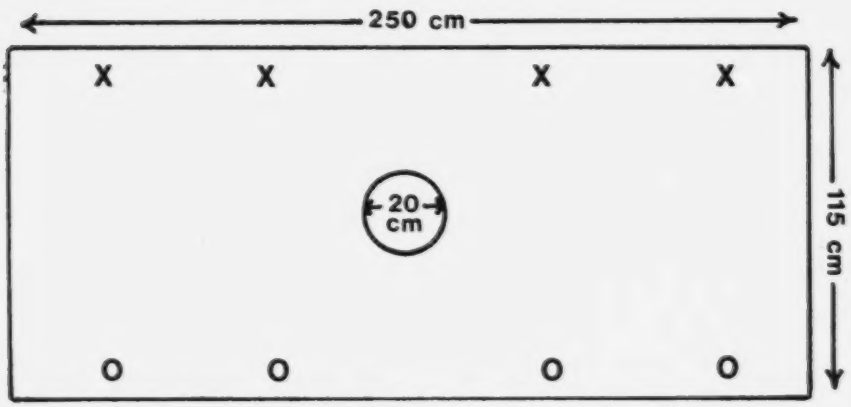
Here is a simple project your whole club can get involved in making. A poncho is great for rainy weather and can also double as a ground sheet or shelter.

Materials:

250 cm of 115-cm wide water-proof coated nylon
8 snap fasteners or heavy velcro fastening

Instructions:

1. Cut a piece of fabric to suit your height. An approximate size has been given. When draped over your head, the bottom edges should fall below your knees.



2. Hem all raw edges.
3. Attach snaps at just above waist and at thigh levels.
4. You can add grommets or metal rings at the edges for use as a shelter.

HIKING ON FIELD TRIPS

One of the pleasures of outdoor life is hiking. Of course, you won't likely go on a muscle-stretching tramp through the mountains, but you may want to go for leisurely strolls along a nature trail with a camera or binoculars in hand.

An adult can walk over level ground at about 6.5 km per hour, but keep in mind that younger members cannot match that pace. In a large group, you should have a Junior Leader or assistant bring up the rear to help stragglers and make sure no one falls behind.

Take frequent rest breaks where there are logs or rocks to sit upon. Allow a five-minute break every twenty minutes for beginners, every hour for experienced hikers.

THEMES

The following are some suggestions for your hiking theme.

ANIMAL HOMES

Animal homes are endless in their variety. The better homes include: tree hollows, hollow logs, bird nests, leaf nests of squirrels, funnels of spider webs, curled leaves of a number of caterpillars and spiders, galleries in wood and crevices in bark galls, ground dens and burrows, crevices in rock, undersides of ground debris (rocks, boards and logs). The poorer homes include: exposed resting and feeding spots such as leaf

surfaces and tree trunks with their boughs and twigs, stems of herbs and grasses (butterflies, leafhoppers, aphids, grasshoppers and locusts), flowers (crab spiders, misumenid spiders, flower beetles, wasps, flies, and ambush bugs). Specialized homes such as muskrat and beaver lodges, cocoons, anthills, and bee and wasp nests can be found on some hikes. Most animals are very specific in their choice of "homes" or places to rest or rear their young, though many species are less specific in their choice of hunting and feeding areas. This hike is very interesting and a good theme.

BIRDS BY SIGHT AND SONG

This is simply a bird hike, designed to acquaint you with the great variety of birds to be seen most anywhere if one makes the effort to look. Stress their beauty, song, behaviour, importance in insect control (swallows, flycatchers, cuckoos, thrashers, warblers, and vireos) and small mammal control (hawks, owls, and shrikes).

Bring along binoculars. These hikes are most fruitful during early morning or late afternoon when you walk the trail slowly and quietly. It's a good idea to carry a field guide to show pictures of the birds you hear singing but cannot see. Better yet, the Audubon Bird Cards can be sorted through for the species you are most apt to hear and/or see on the hike.

WILD FLOWERS

Wild flowers always offer interesting possibilities along the nature trail. Identify them and discuss their uses by man and animals. Relate them to common flower garden relatives with which most people are familiar. Many wild species are being eyed by horticulturists whose efforts in plant breeding may bring many of them into the future gardens of North America. Take a camera and discover the photographic possibilities.

ACTION TIME - Seed and Plant Match

The leader should collect seeds from plants found in the area. Divide the group and give each small group two or three types of seeds. The 4-H members should then go out and locate the plants that produced the seeds. The exercise will increase your observation skills. A leaf from each plant can be collected and then the matching seed and leaf can be taped to construction paper to make a bulletin board display for your club room. You could also make a display for your record book.

LET'S LOOK AT A FOREST

A general analysis of a forest can be made on this hike by pointing out the important trees and shrubs of the particular forest chosen. Bring in the uses of the various trees stressing lumber and pulp production. Forestry practices such as: logging, timber inventory, silviculture and reforestation, and fire protection can be discussed. Tree disease and other

detrimental factors such as insects and grazing can be mentioned. Choose a couple of straight-grown trees and estimate or measure their volumes in "board feet". Describe forest succession in very general terms. Describe the common small animals and game animals of the particular forest preserve and define "multiple-use" of forests. This can be a very interesting and very informative topic.

ANIMAL TRACKS AND SIGNS (in summer and winter)

The theme for this hike concentrates on looking for tracks and other evidence of animals in the park. Biologists and others can often determine much about the animals in a certain area by looking for their evidence rather that actually observing the animals themselves. By some real detective work much can be told about densities, food habits, range and behaviour of many species of animals by simply reading their "signs". Tracks are best found on sands, muds, and soft snow, but leaf miners, snails and slugs leave their "tracks" in a different way. Other examples of signs easily found are: claw marks on trees, hair and feathers around tree holes and on tree limbs which are hawk and owl feeding evidence, cast skins of insect larvae, spiders, and snakes as well as food caches of beaver, mice, chipmunks, shrikes, and bluejays. There are many others that could be listed, so be on the lookout for details that will make this hike more interesting. On snow, fox, squirrel, and rabbit tracks can be followed for some distance and evidence of actual behaviour can easily be observed.

ACTION TIME - Track Stories

Discover "track stories" in the sand or mud. Search closely for the trails and tracks of insects, mammals, and birds. What made them? What was the animal doing? Why was it there? How large was the animal? How many animals were there? Was it moving fast or slow? Attempt to find a track story involving two different animals. Write about it in your record book.

SOUNDS OF THE NIGHT

This could be a relatively short hike taken in deep dusk and continued until after dark. It should be planned to take in an open marsh, open field, and deep woods, if possible. Be very quiet and walk slowly to better hear the sounds of the night, and to ensure safety. Warm, calm nights are best. Listen for: frogs and toad calls, owls, night hawks, whip-poor-whills, wood pewees, crickets, tree crickets, animal (mammal) calls, alarm notes, scurrying of small animals on the forest floor, noisy retreat of large animals, and deer "snorts". You may even hear night crawlers moving vegetation as they look for something to eat on the surface of the ground. Flying squirrels can sometimes be heard scampering up tree trunks. Listen to the rustling of leaves and whispering of wind in the pines. If you can imitate well, you might station the group while you walk up the trail and then give some of the calls you can do well. The calls of a timber wolf or the great horned owl are easily learned and are spine-tinglers.

IF YOU ARE LOST AND HAVE NO MAP OR COMPASS

Let us imagine that you are lost in very unfamiliar territory in one of our forests. What would you do?

1. PLAN

If you are expecting your friends to look for you, it's best to stay right where you are. But let us suppose you know that no one will find you. First, remain calm--panic is your worst enemy. Think back over the route you travelled. Do you remember landmarks? Were there any recognizable mountain peaks or rivers? How long did it take to get where you are? If you don't have a map, draw one on the ground with as many landmarks as you can remember.

After you have thought out your situation, decide whether to stay where you are or to attempt to walk out. Consider the weather, obstacles you might meet, and the time you think it should take to reach your destination.

Often it is best to stay where you are if you have found a good supply of drinking water and shelter. Don't eat if you lack water as eating uses up the body's water reserves. Don't exhaust yourself trying to get out--your first consideration must be to keep physically and mentally fit.

2. MARK YOUR WAY

After you have carefully considered the situation and think it is better to leave, there are several methods you can use to find your way out.

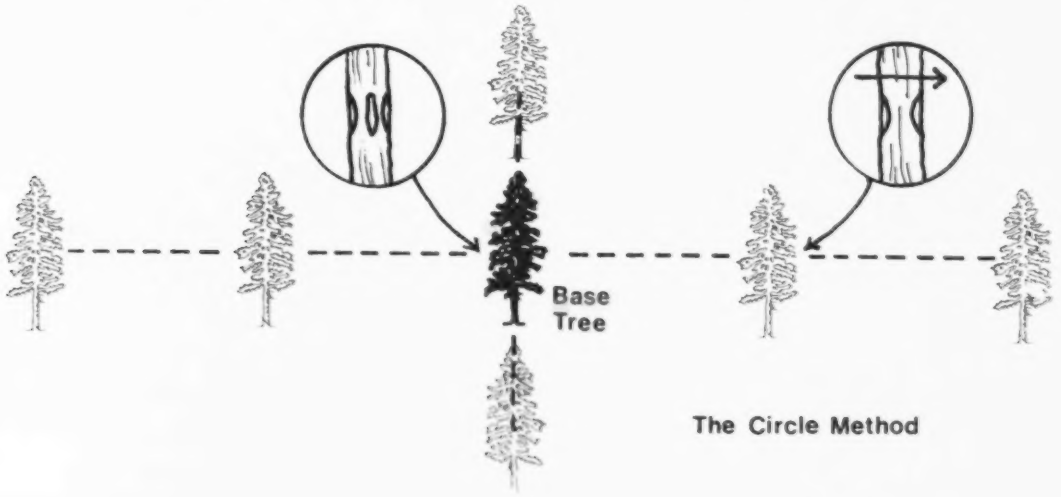
THE CIRCLE METHOD

If you have found no familiar landmarks, this method will help you find a familiar spot without getting lost a second time.

The first step is to peel the bark off four sides of a tall tree. If you have no knife or axe use a sharp-edged rock. This tree will be your base tree. Choose a direction, then walk in a straight line as far as you can from the base tree without losing sight of it. At this point mark another tree with two peelings--one on the side facing your line and the other on the opposite side. Now, pick another tree even further away. Keep your second marked tree and the base tree lined up with a third tree. Keep this up until you have covered perhaps half a mile. Be on the lookout for any familiar landmarks which may help you realize where you are.

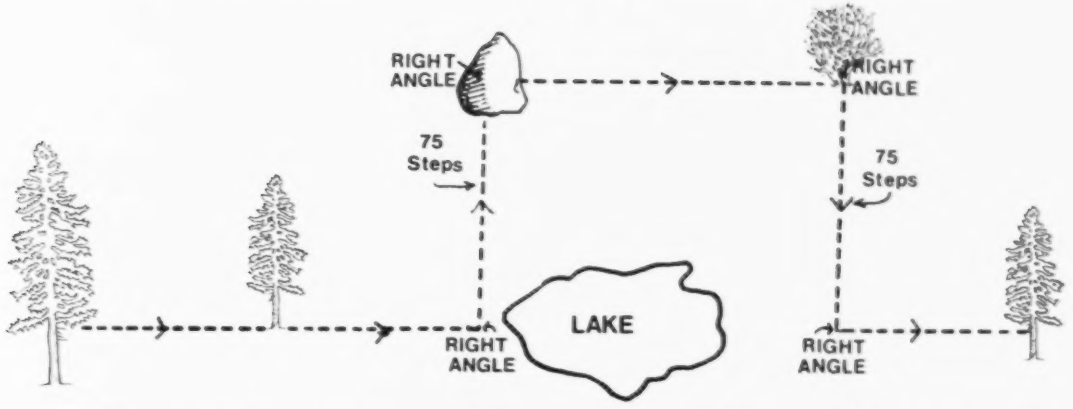
If you find nothing to help you, return to the base tree and start out in a different direction, marking trees in the same manner.

It is important that you should save your energy and remain calm. Also it would be a good idea to leave a note or some sign to anyone who might be looking for you. Attach it to the base tree.



The Circle Method

THE STRAIGHT LINE METHOD



Perhaps you know the general direction in which you should travel. If so use the straight line method.

First choose a landmark such as a large rock, a peak, or a tree. Walk toward it. As you go occasionally pile up some rocks to mark your trail.

Or if no rocks can be found, line up some sticks in the shape of an arrow, or tear bits of clothing and tie them to bushes to show where you have travelled. This will not only help searchers find you, but if necessary, will help you get back to where you started.

If possible, scratch arrows in the ground. But rely on them only if you are sure they will remain there. Don't use them if the ground is very soft or if the weather looks threatening.

When you get to your landmark, line up a new one ahead of you. But be sure all your landmarks are in a straight line.

What if you run into a lake or marsh or some other obstacle that prevents you from travelling in a straight line?

Simply turn at a right angle, line up another landmark, and walk straight toward it. Count your steps until you have come to the end of the obstacle. Then turn in the direction you first started travelling, line up another landmark, and travel toward it until you have again passed the obstacle. Now turn toward your first straight line, and count off the same number of steps.

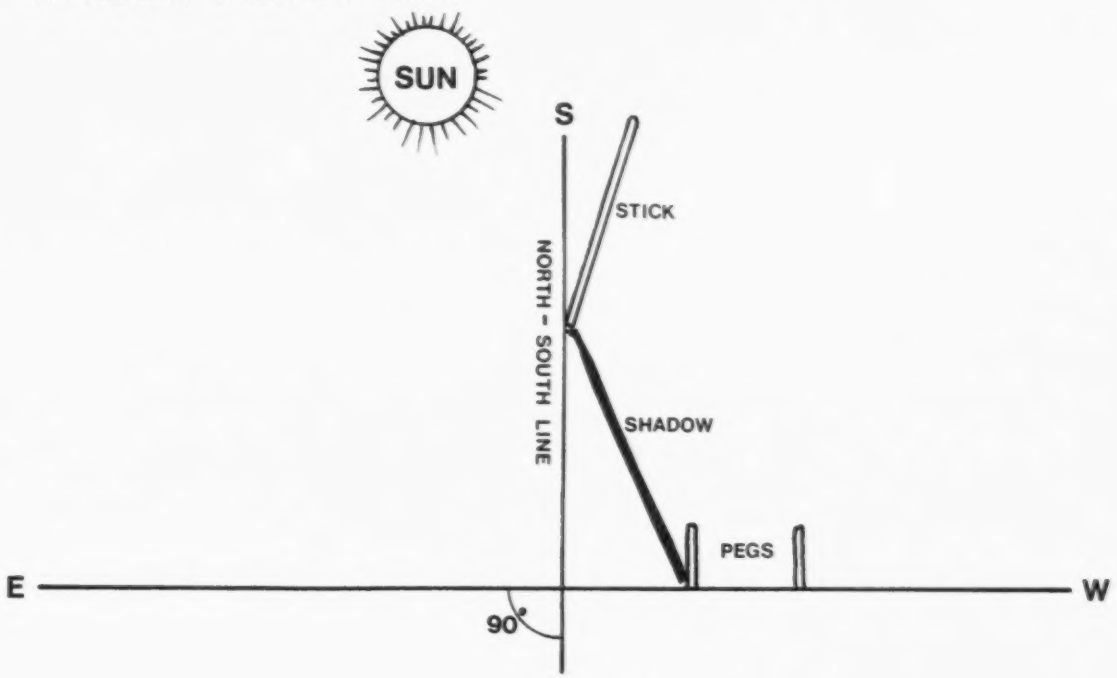
When you have walked that number of steps, you should be back on your beginning straight line. Turn in the direction you were first going, line up the next landmark, and continue on your way.

If you travel in a straight line in any direction for any distance, you can be sure you will eventually cross a logging road or highway. Then you are on your way back to civilization.

3. TELLING DIRECTIONS

Do you know how to tell directions without a map or compass? Don't try to tell by moss on a tree, or by the direction the wind is blowing or by which way the trees are leaning. These methods can often be wrong. Below are some reliable ways:

THE OWENDOFF SHADOW-TIP METHOD



This is the fastest and most accurate of all direction finding methods that doesn't rely on maps or compasses.

1. Drive a stick about 1 m high into the ground. It need not be vertical.

2. Mark the tip, immediately, of the shadow cast by the stick with a peg or stone.

3. Wait 10 or 15 minutes and mark the new location of the shadow-tip.

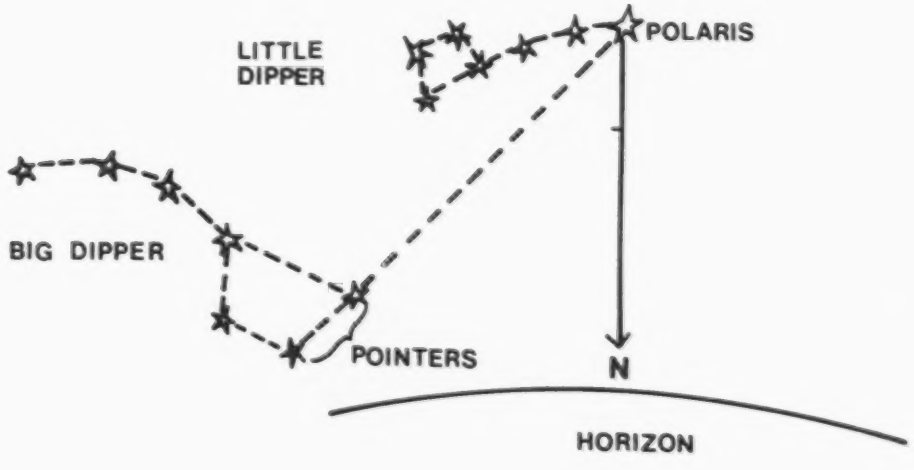
4. A straight line through these two points is a true east-west line. Draw a line at right angles to this east-west line passing through the stick. This line is a north-south line with south toward the stick.

THE NORTH STAR

On a clear night the north star, Polaris, can be seen in the direction of true north. Polaris can be easily found by locating the Big Dipper (Ursa Major). The two stars farthest from the handle of the dipper are the pointers. They point to Polaris which is approximately five times the distance between the pointers away from the Big Dipper.

The North Star is not as bright as many other stars but it is brighter than any others close by. It is a very important star to know because it does not change position while all other stars do.

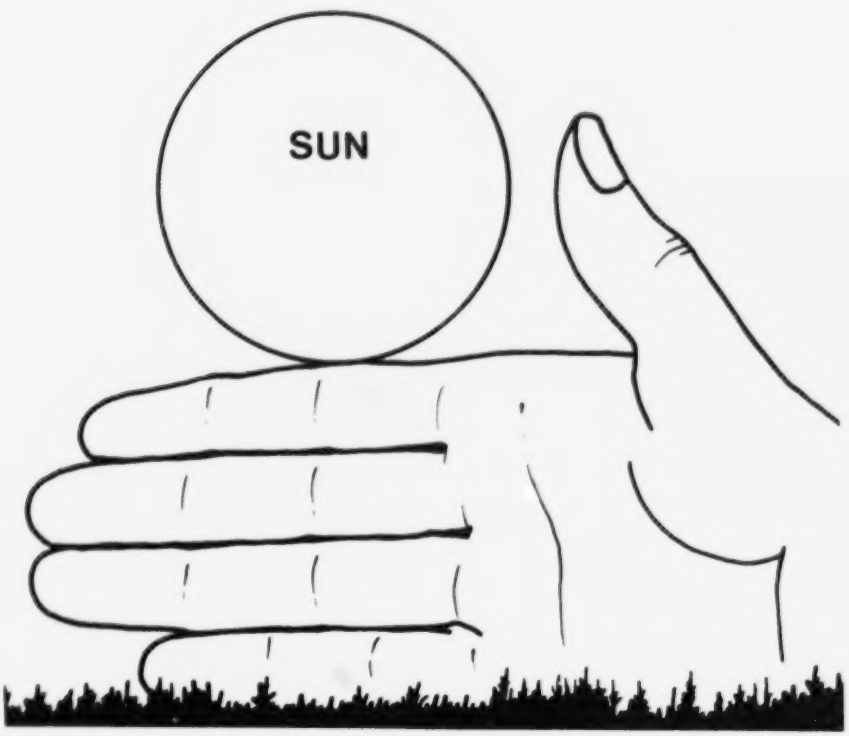
After you have located the North Star, drive a stick into the ground and draw a line from it pointing toward the star. In the morning, it will be easy to tell which direction is north. If the northern skies are cloudy, it will be worthwhile to know a few other stars. Simple star maps are available in books such as Webster's New World Dictionary and all encyclopedias and books of knowledge.



4. WHEN WILL THE SUN GO DOWN?

You may find yourself without a watch and you want to cross a lake before nightfall. Or perhaps you have your watch, but don't know when the sun will set. How much time do you have before sundown?

Face the setting sun and extend your arm at full length toward the sun, your wrists bent in and your fingers extended just below the sun. Count the number of fingers between the sun and the horizon. Allow fifteen minutes per finger. If six fingers separate the sun from the horizon you have an hour and a half.



HORIZON

ONE HOUR TILL SUNDOWN

5. DETERMINING DISTANCES

In the next unit when you learn about compasses and maps, you will need to know how to estimate distance. One method used is pacing.

PACING

This method determines the approximate distance by using your double-step or pace as a measure. The distance from left foot to left foot is a pace.

Measure out a course on flat ground that is 100 metres long. Walk the distance and count the number of paces it takes. Do this several times. This is called the pace rate.

Record this in your record book under pacing and personal measurements.

If you divide the total distance covered (100 metres) by the total number of paces, you can determine the length (in metres) of your pace. Record this in your record book.

How can this method be used in the outdoors?

You can determine the distance you have walked on flat ground by using this formula. Example: If you have walked 180 paces, what distance have you gone?

$$\text{number of paces} \times \frac{100}{\text{pace rate}}$$

$$180 \text{ paces} \times \frac{100 \text{ metres}}{60 \text{ paces}} = 300 \text{ metres}$$

In other words, 180 paces equals 300 metres.

How many paces per kilometre?

Remember 1 kilometre = 1000 metres. You know the number of paces it takes to walk 100 metres. How would you determine the number of paces it takes to walk 1 kilometre?

If your pace rate is 60 paces per 100 metres,

it will take you 600 paces per 1000 metres

OR: 600 paces per 1 kilometre.

Record the number of paces it would take you to cover 1 kilometre.

TIME ELAPSED

Another method you can use to estimate distance is by elapsed time. Depending on the type of terrain, you will walk a distance of one kilometre in a certain amount of time.

The chart shows an average estimation of time to cover a distance of one kilometre by walking and by running.

NUMBER OF MINUTES TO COVER 1 KILOMETRE	HIGHWAY	OPEN FIELD	OPEN WOODS	MOUNTAIN FOREST
WALK	10	15	18	25
RUN	6	8	10	14

Complete the chart for the Time Elapsed exercise in your record-book section.

USEFUL MEASUREMENTS

Average walking speed:	flat	5.5 km per hour
Average walking speed:	broken, wooded	3.5 km per hour
Average snowshoeing:		3.5 km per hour
Average skiing:		5.5 km per hour
Average jogging:		8.0 km per hour

In mountains, allow one hour for every 300 metres of elevation climbed.

STUDYING THE ENVIRONMENT

Studying the environment is essential so that you can understand the need for conservation. It is an attitude which you can develop in a variety of outdoor programs. Some study suggestions follow; perhaps you can think of your own and display them on Achievement Day.

INSECT STUDIES

Field trips can be undertaken to study insects. A first field trip can be taken to collect and identify the insects of specific areas. Take a population count of various insect species. Such numerous species as grass hoppers or crickets would provide a suitable study. To take a count collect between 30-50 of one species and mark them in some way with paint or coloured nail polish, make sure they are released in the same area. Later in the day collect the same number of insects as were marked earlier in the day. The number of marked insects should be noted. The formula for the population count is:

$$\frac{\text{number of collected and marked} \times \text{number collected the second time}}{\text{Number of marked ones that are recaptured}}$$

Another field trip might be for the study of one particular species of insects. Follow an insect for 10-15 minutes and repeat this procedure with other individuals of the same species and try to answer the following:

a. How does the insect move?
b. What does the insect eat?
c. How does the insect eat?
d. How fast can the insect travel?
e. What type of community does the insect live in?
f. Did the insect meet any other insects or animals? What happened?
g. How does the insect breathe?
h. How is the insect protected from extreme temperatures?
i. How is the insect protected from man and other animals?
j. Is the insect beneficial or harmful to man? Why?

Numerous follow-up activities can be carried out: the photography of moths and butterflies, diagramming insect food chains, raising colonies, maintaining bee hives, and so on.

ACTION TIME - Inhabitants of the Soil

An excellent and environmentally safe way to observe insects follows. Take a piece of sheeting, or other light coloured fabric, one square metre (1 m^2). Carefully pick up a handful of dirt. Lay it on the sheeting. Observe the smallest living thing you can find. Use a "microbox" or hand magnifying glass to observe the specimen in more detail. Can you identify the insect or worm? Find the largest specimen in your soil sample. Which was the most unusual? See if you can sketch a picture of your observations and identify the soil inhabitants.

After your observations, be sure to return the soil to its original spot.

ACTION TIME - Who's Living Here?

Take a rope ten metres long and lay it on the ground in a square. Within this area, observe all the living things you can find, all the unusual plants and animals. Do you recognize any of them? Write down all your observations and write a story about your study of this environment.

Restore everything to its original state after observation.

THE STUDY OF A POND COMMUNITY

Aim: To understand the interrelationships that exist among all living creatures within a "community".

Method: Identify and observe pond insects and pond life. Investigate the animal and bird life at the edge of the pond. Observe and identify plant life in and around the pond.

Follow-up: The follow-up studies could include (a) the life cycles of typical pond insects such as the dragonfly, damselfly, or caddisfly (b) the construction of simple food chain diagrams or (c) the discussion of producers, consumers, and decomposers.

POND OR SLOUGH STUDY

There is a world of information going unnoticed in marshes. There is probably no other spot where there is as much life per acre. The organisms below the water's surface are in a world little known and very interesting.

IMPORTANT:

Remember most fieldwork can be done without collecting specimens! Unnecessary collecting is wasteful and can rapidly lessen the interest of an area. Use sketching or photography instead. If collecting is essential to your work, make sure that you take only enough for your needs. Use proper containers, and if in a party, appoint specific collectors for the necessary specimens. Also remember to return living material to the exact spot from which it was taken.

PLANT STUDIES

ACTION TIME - Nature Scavenger Hunt

Compose a nature scavenger hunt. 4-H members should work in pairs and lists should be made for each pair. The list can be of general nature or follow specific themes such as trees and shells. An example follows of a general list in poetry form:

"Locate a pine tree somewhere in view;
A pine cone from here is the first item for you.

Find 1 piece of burnt bark without being shown.
Next find 1 piece of litter and 1 small stone.

You're doing real well, now add 1 reddish leaf.
Next break off 4 thorns without causing you grief.

Find a stick that you think looks like an animal;
Then find 5 small seeds from anything at all.

Collect a piece of Spanish Moss that has fallen to the ground.
Then find a dead leaf that makes a crunching sound.

Find a dead piece of fern that is brown to you and me;
Next pick one green pine needle from a living pine tree.

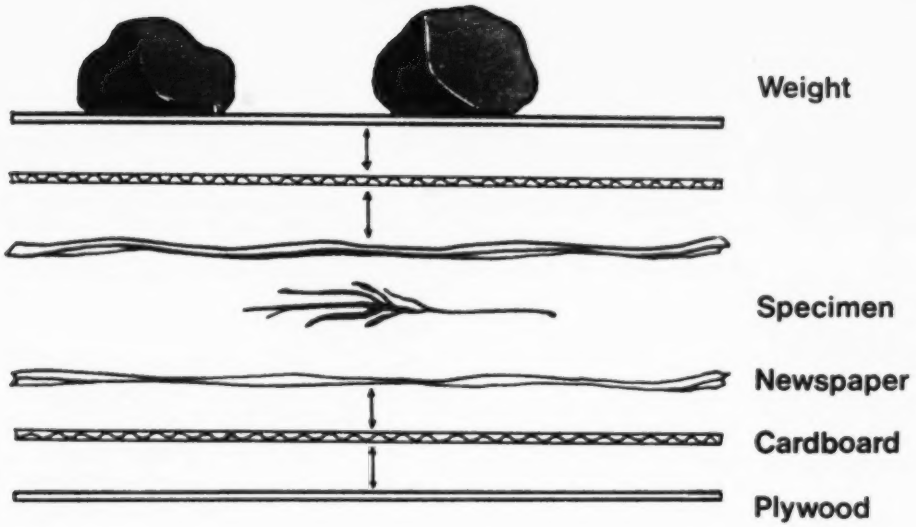
Bring back one live insect, the best you can borrow.
Search the ground closely and collect 1 small white flower.

Don't give up now, you are almost through;
A feather of a bird is the last item for you".

See if you can develop a scavenger hunt game like this, then try it with your fellow club members.

PRESSING SPECIMENS

Press the plants you have collected as soon as possible, certainly before they have dried out. Spread the specimen on a piece of newspaper so that some leaves and flowers face forward and some backward. If the plant is too bushy to lie flat, break off some of its branches. Place a sheet of newspaper over the specimen and separate it from other plants with sections of corrugated cardboard cut from old cardboard boxes. Pile the specimens up as illustrated and place boards or a sheet of plywood on top to support the weights. A pile of specimens 30 cm high will require 10 to 15 kg to press the specimens. You can use books, large rocks, or sandbags for weights.



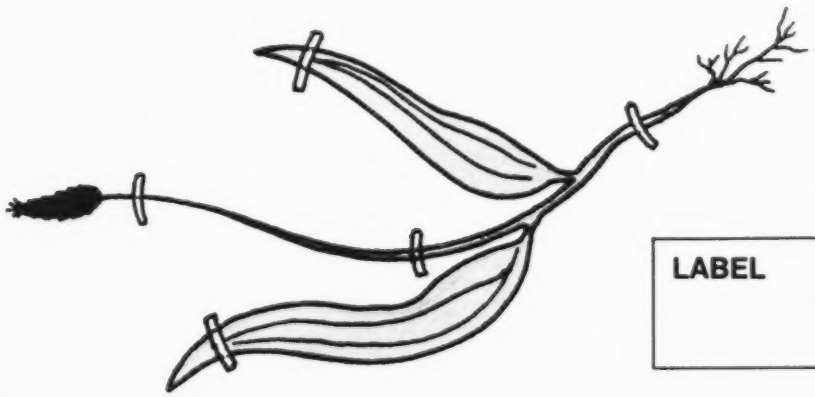
ACTION TIME - Mosaic Nature Pictures

Collect dried seeds on one of your nature hikes. Glue the seeds onto construction paper to produce mośaic pictures of wildlife and environmental scenes. The soft brown shades of the seeds can add to the decor of most homes and clubrooms.

MOUNTING SPECIMENS

For neat storage and effective displays, your pressed plants should be mounted on art paper or thin white cardboard. There are several ways to mount your specimens.

1. Sew them to the cardboard with heavy linen thread of an appropriate color.
2. Glue the specimens to the cardboard with Duco cement, Ambroid, or any such glue.
3. Fasten the plant down with strips of linen tape as shown in the illustration.



LABEL

ACTION TIME - Leaf Plaque

Collect a variety of leaves from the trees, shrubs, and weeds on a field trip. Prepare a cardboard ring that is approximately 3 cm wide and large enough to encircle the leaf being cast. Grease the leaf with vaseline and place it vein side up on a piece of newspaper. Tie a piece of heavy string into a loop. Place the string loop into the cardboard ring so that half of the loop is outside the ring. This will allow you to hang the plaster cast on the wall. Now, very slowly, pour some Plaster of Paris onto the leaf and string loop. Fill the cardboard collar with the plaster. Allow the plaster to dry overnight. Remove the cardboard ring and peel off the leaf. Gently wash the cast with warm soapy water. Paint the cast and the leaf print in contrasting colors.

LABELLING

A plant collection that is improperly labelled or identified is next to useless. A suggested label plan which could be typed or printed and glued to the mounting sheet is illustrated:

Specimen No. 36	Location 7 km S.W. Dauphin
Common Name Lamb's Quarters	Habitat Aspen Grove
Scientific Name Chenopodium Album	
Date July 10, 1970	Collector Joe Jones

The information found on the specimen label is taken from the notes you made in your field note-book when you collected the plant. If you have trouble in identifying specimens you have collected, ask your leader to help you.

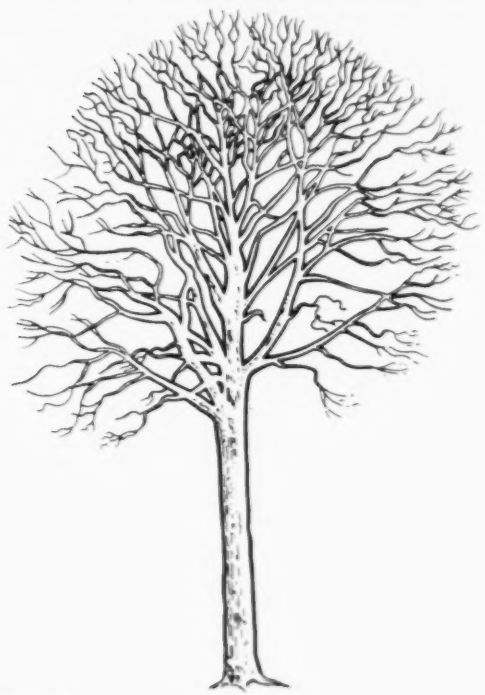
Your mounted plants should be stored away to protect the specimens. You should scatter a few moth crystals among the specimens while in storage to prevent insect damage.

As you gain experience in working with plants, you will learn more about them. You will discover their scientific names and many interesting facts about the way plants grow, their importance to man and the other animals, and the types of habitat (growing conditions) various plants require.

TREE STUDY

Take an early fall trip and identify the trees in or close to your field work area. Keep a record of an individual tree for the rest of the club year. The record might include:

a. Type of tree described.
b. When did the tree lose its leaves?
c. Measure diameter and height of the tree.
d. Were there any birds' nests?
e. What kinds of plants grow under the tree?
f. Are there any insects on the bark or leaves of the tree?
g. What birds and animals visit the tree?
h. Others.



WINTER

a. Make a diagram of a small twig.
b. Carefully open and observe a bud.
c. What colour is the bud inside?
d. What animals or birds visit the tree?
e. Are there insects on the tree? (pupae or eggs)?
f. Have any animals made their home in this tree?
g. Has anything fallen from the tree?
h. Others.

SPRING

a. When did the buds first start to swell?
b. When did the leaves first appear?
c. Did anything appear before the leaves?
d. Draw a sketch of the flower.
e. How long does it take a leaf to reach its full size?
f. Are birds building nests in this tree?
g. What plants grow under the tree?
h. Others.

SUMMER

a. Are there any holes or markings on the leaves?
b. What animals and birds visit the tree?

c. When did the young birds leave their nests? (if applicable)
d. Are there any insects on the leaves or bark?
e. Did you hear any noises coming from the leaves high in the tree?
f. Are there any branches without leaves on them?
g. Did you notice anything coming from the bark?
h. Measure how much growth has taken place in 10 small branches.
i. Others.

ACTION TIME - How Old Is a Branch?

Determine the age of tree branches in your area. Starting at the tip of a branch, locate the terminal bud (the last bud on the tip of a twig or branch). Now move along the stem until the first bud scale scar is located. The scar completely encircles the branch and is the point where the last growing season's terminal bud was located. Usually, the distance between the bud scale scar and the terminal bud represents one year's growth. How old is the branch? In what year did the branch grow the most? Do other branches on this tree show the same growth pattern? What could have caused more growth in one year than in another?

ACTION TIME - Word Scramble

What names of trees can you unscramble from this list?

1. masbla _____
2. yikroch _____
3. kramacat _____
4. woirdono _____
5. lilwow _____
6. crihb _____
7. cersup _____
8. rif _____
9. roplap _____
10. panse _____

RECORDS AND RECORD KEEPING

PURPOSE OF RECORD KEEPING

1. record of information
2. record of work done
3. learning how to keep records
4. record of club activities
5. record of achievement

WHAT IS A GOOD RECORD BOOK?

1. COMPLETENESS - If any part of a record book is not finished, it detracts from the rest.

2. ACCURACY - Keep an accurate account of the costs involved to give your calculations some meaning.

3. PICTURES AND ILLUSTRATIONS - Add originality and interest to the records. At the Achievement or Visitors' Day you should have a picture of the project members and leaders in your record book as well as pictures of any outdoor activities you participated in.

4. NEWS SECTION - This should include a record of 4-H activities at local, provincial, national, and international levels. 4-H news should be collected throughout the year. When an item is clipped from the paper, the date and name of paper should be written onto the clipping.

5. NEATNESS - Neatness is important in completing your record book. However, it is understood that the record book is developed throughout the entire year and not just the day before the Achievement or Visitors' Day.

4-H OUTDOORSMAN RECORD BOOK

MEMBER'S NAME _____

ADDRESS _____

AGE _____ BIRTHDATE _____

NAME OF PARENT OR GUARDIAN _____

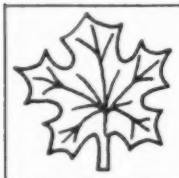
NAME OF CLUB _____

NAME OF CLUB LEADER _____

NAME OF PROJECT LEADER _____

NO. OF YEARS IN 4-H _____ NO OF YEARS IN PROJECT _____

ACHIEVEMENT DAY PROJECTS AND ACTIVITIES IN THE OUTDOORS

	HOW WOULD YOU DO IT? Make a model or example. Complete as many of these as you can with a minimum of three activities.	Date Completed	Leader's Initials
1.	Make a fire without matches.		
2.	Make articles of clothing from natural materials.		
3.	Make bandages or other medical aids.		
4.	Make rope, string, or twine from natural materials.		
5.	Find your way out without a compass.		
6.	Practice making different signals.		
7.	Show a collection of edible plants from your area (and those that should <u>not</u> be eaten).		
8.	Make simple but adequate shelters.		
9.	<u>Go camping! Good luck</u>!		

Learn three knots and display them in your Outdoor Kit.

Complete an environmental study of either: insects, pond, leaves, or trees.

PACING AND PERSONAL MEASUREMENTS

Personal:

Height: _____ centimetres

Arm span (finger tip to finger tip): _____ centimetres

Length of arm (finger tip to shoulder): _____ centimetres

Hand span (little finger to thumb): _____ centimetres

Pacing:

Length of one pace (left foot to left foot): _____ metres

Number of paces to 100 metres: _____ paces

Number of paces per kilometre: _____ paces

Number of paces required to walk 500 metres: _____ paces

Time needed to walk one kilometre in:

a) Open field _____

b) Woods _____

c) Hilly country _____

MAKING A SIMPLE COMPASS

1. Use an ordinary needle.

2. Stroke the needle with one pole of a magnet, always the same pole and in the same direction, until the needle is magnetized. Test for magnetism by trying to pick up a pin with the needle.

3. Once your needle is magnetized, fill a shallow dish half full of water. Place a piece of paper on the surface of the water, and place the needle on the paper.

   a) Observe what happens.

   b) Repeat this a number of times.

Does the needle behave like a compass? How could you tell which end points north? How would you improve your compass?

DIARY

Complete a story of your outdoor experiences. Add any related pictures on the next page.

PICTURES

SPECIAL ACTIVITIES PARTICIPATED IN

Field Days, Rallies, Fair, Demonstrations, Hikes, Cookouts, etc.

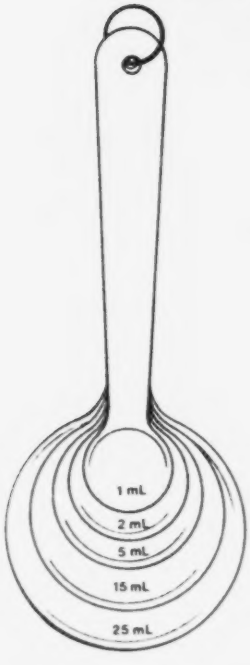
Date	Kind of Activity	I Took Part By:

RECORD OF PROJECT MEETINGS

(note any guest speakers)

Project Meeting Date	Material covered about project	I put this new knowledge to use by:

METRIC INFORMATION



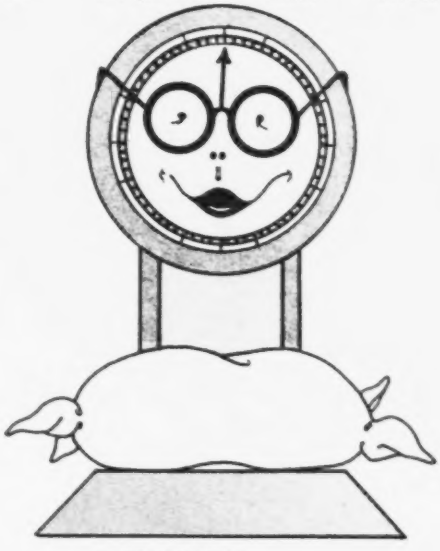
METRIC MEASURES ARE AVAILABLE IN THESE SIZES

250 mL replaces 1 cup
500 mL replaces 2 cups

Approximate Conversion to Metric Measures

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL	BASE UNIT
		MASS (weight)			
oz.	ounces	28.349	grams	g	
lb.	pounds	0.454	kilograms	kg	
ton	short tons (2000 lbs)	0.907	tonnes	t	gram
g	grams	0.035	ounces	oz.	
t	tonnes (1000 kg)	1.102	short tons	ton	
		VOLUME			
tsp.	teaspoons	5	millilitres	mL	
tbsp	tablespoons	15	millilitres	mL	
fl.oz.	fluid ounces	28.413	millilitres	mL	
pt.	pints	0.568	litres	L	
qt.	quarts	1.137	litres	L	
gal.	gallons	4.546	litres	L	litres
bu.	bushels	36.370	litres	L	
mL	millilitres	0.035	fluid ounces	fl.oz.	
L	litres	1.760	pints	pt.	
L	litres	0.880	quarts	qt.	
L	litres	0.220	gallons	gal.	
L	litres	0.027	bushels	bu.	
		LENGTH			
in.	inches	2.540	centimetres	cm	
ft.	feet	0.305	metres	m	
yd.	yards	0.914	metres	m	
mi.	miles	1.609	kilometres	km	metre
mm	milimetres	0.0394	inches	in.	
cm	centimetres	0.394	inches	in.	
m	metres	3.281	feet	ft.	
m	metres	1.094	yards	yd.	
km	kilometres	0.621	miles	mi.	
		ENERGY			
kcal	kilocalorie	4.186	kilojoules	kJ	joule
kJ	kilojoules	0.239	kilocaleries	kcal	

MUNSTER METRE
MEASURES LENGTH



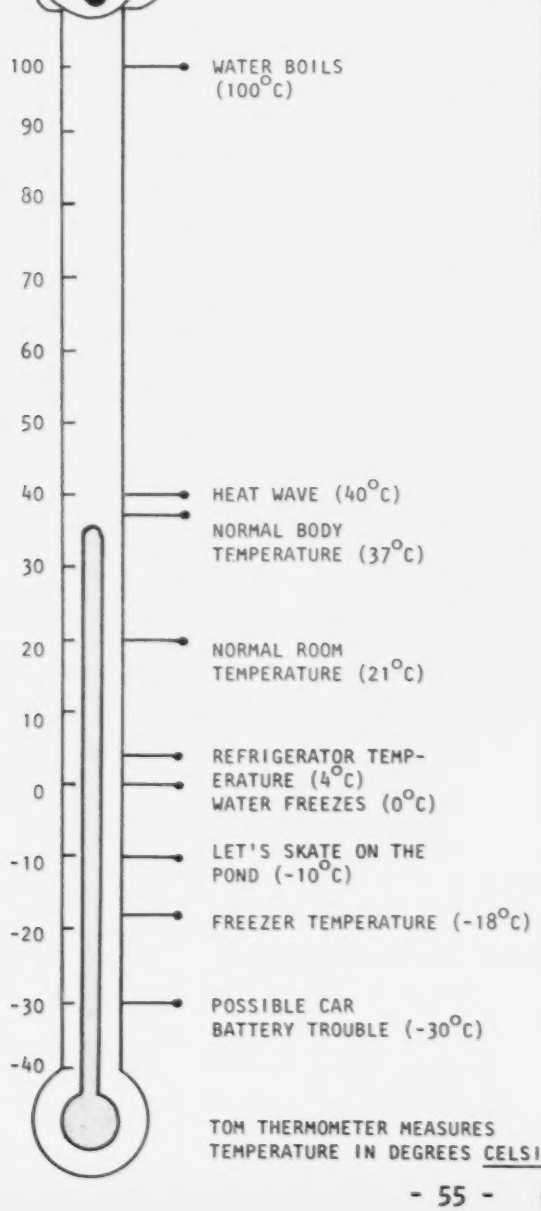
SAM KILOGRAM
MEASURES WEIGHT

LILY LITRE
MEASURES VOLUME

METRIC MULTIPLES AND PREFIXES TABLE

Multiplying Factor	Prefix	Symbol
1,000,000 = 10^6	mega (meg a)	M
1,000 = 10^3	kilo (kil o)	k
100 = 10^2	hecto (hek to)	h
10 = 10^1	deka (dek a)	da
(Base Unit) 1 = 10^0		
0.1 = 10^{-1}	deci (des i)	d
0.01 = 10^{-2}	centi (sen ti)	c
0.001 = 10^{-3}	milli (mil i)	m
0.000,001	micro (mi kro)	μ

(These prefixes may be applied to all metric base units.
Example: Base Unit = litre
Add kilo to litre (symbol kL) = kilolitre. The multiplying factor is 1000. This means a kilolitre equals 1000 litres.)



TOM THERMOMETER MEASURES TEMPERATURE IN DEGREES CELSIUS (°C)

TEMPERATURE: °F = 9/5 + 32
°C = 5/9 - 32

OVEN TEMPERATURES:

	°C	°F
Very slow	120-135	250-275
Slow	150-165	300-325
Moderate	175-190	350-375
Hot	200-220	400-425
Very Hot	230-245	450-475
Near boil	245-290	475-500

ADDITIONAL METRIC INFORMATION

from:

Metric Branch
Alberta Government Services
12th Floor, Park Square
10001 Bellamy Hill
Edmonton, Alberta T5J 3C1

Metric Commission Canada
Box 4000
Ottawa, Ontario

Information Division
Canada Department of Agriculture
Ottawa, Ontario K1A 0C7

District Extension Office

OR

Publications Office
Alberta Agriculture
9718 - 107 Street
Edmonton, Alberta T5K 2C8

PROJECT EVALUATION

In order to keep meeting your needs in the 4-H program, we would like to request your assistance in completing this evaluation form. Make your suggestions on this sheet as you use this book. After the project has been completed, mail this form to:

Project Evaluation
4-H Branch
Alberta Agriculture
7000 - 113 Street
Edmonton, Alberta
T6H 5T6

(use another page if required)